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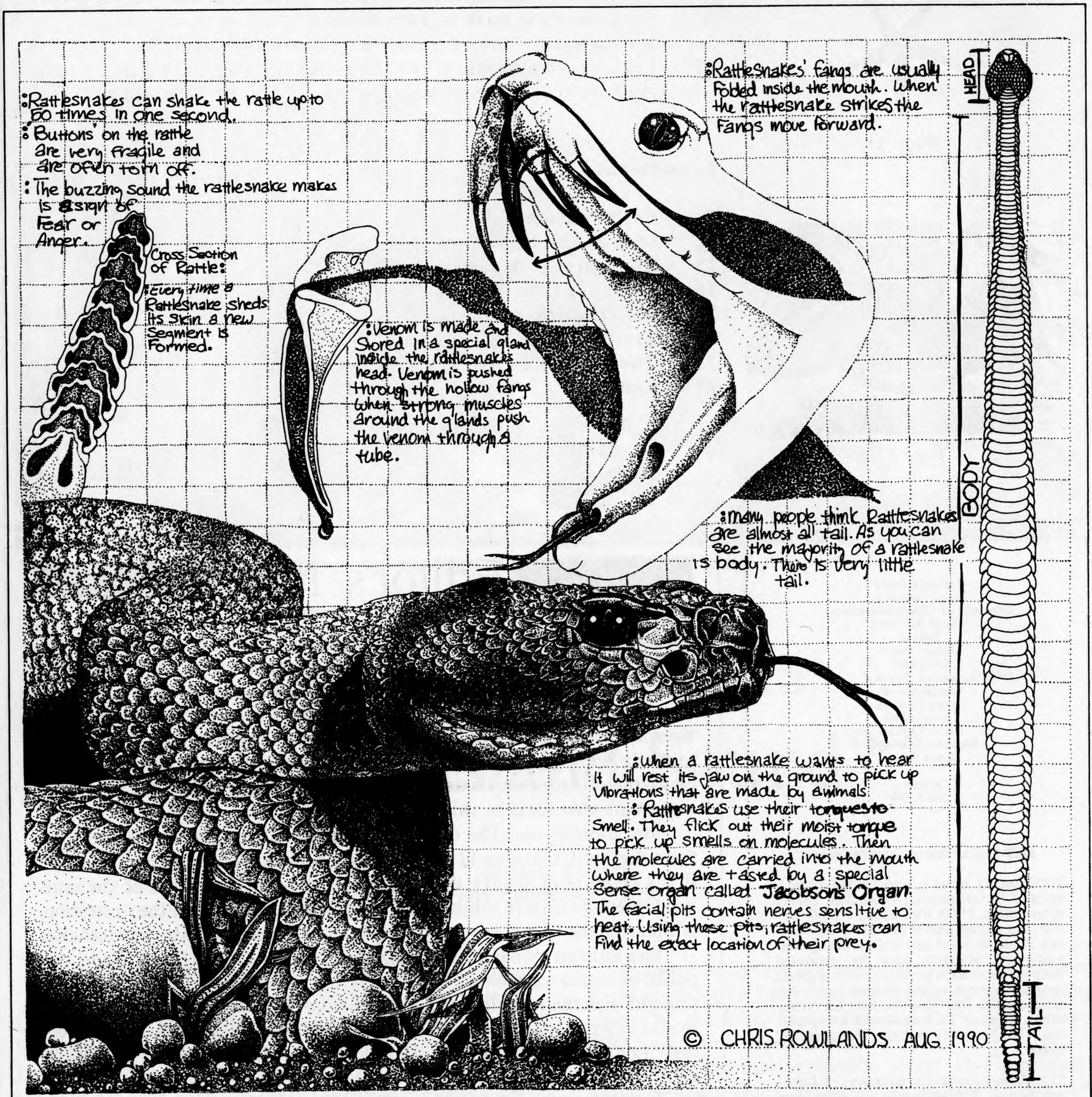
:Rattlesnakes can shake the rattle up to 50 times in one second.
: Buttons on the rattle are very fragile and are often torn off.
: The buzzing sound the rattlesnake makes is a sign of Fear or Anger.
Cross Section of Rattle:
: Every time a Rattlesnake sheds its skin a new Segment is Formed.
:Venom is made and Stored in a special gland inside the rattlesnakes head. Venom is pushed through the hollow fangs when strong muscles around the glands push the venom through a tube.
:Rattlesnakes' fangs are usually folded inside the mouth. When the rattlesnake strikes the fangs move forward.
HEAD
BODY
TAIL
:Many people think Rattlesnakes are almost all tail. As you can see the majority of a rattlesnake is body. There is very little tail.
:When a rattlesnake wants to hear it will rest its jaw on the ground to pick up vibrations that are made by animals.
: Rattlesnakes use their tongues to smell. They flick out their moist tongue to pick up smells on molecules. Then the molecules are carried into the mouth where they are tasted by a special sense organ called Jacobson's Organ. The facial pits contain nerves sensitive to heat. Using these pits, rattlesnakes can find the exact location of their prey.
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A Symbol of the Wilderness

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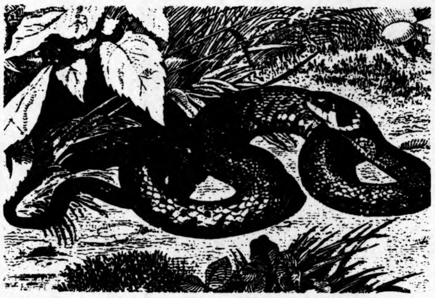

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Editor's Note

An educator once told me that a good teacher should try to communicate one big new idea each class period. Each student must walk away from the class with the clear sense that he has learned something, that he has added tangibly to his knowledge. In *Connecticut Environment*, on the one hand, we don't presume that we are here to teach; on the other hand, if we were to teach, we'd like to think that we have more than one single idea per magazine. At any rate, let us express here what are probably the two most important new ideas in this particular issue.

Idea number one: The timber rattlesnake is not an evil creature, sent from the devil, that should be feared, hated, and killed at any opportunity. It is a creature of beauty and power and dignity, a creature of the true wilderness, a creature whose survival is now dependent on the protection of man. So, the first idea is very simple – don't kill the timber rattlesnake.

Idea number two involves Long Island Sound. I asked Sarah Wade, the public outreach coordinator for Long Island Sound, to articulate what she thought was the most important idea about the Sound. Then I, the editor, would rewrite it and improve on it. Miss Wade came up with the following: "Long Island Sound is a unique ecosystem that supports a multitude of life forms. An increasingly large and concentrated human population has imposed profound changes in that ecosystem. If we are to continue to use the Sound as we have in the past, then we must take on a stewardship role beyond mere support of legislation and state programs; we must make individual changes in the way we live." I can't improve on that.

There it is. Two major ideas in one issue. Not bad. R.P.

The time has come to reevaluate our responsibility to Long Island Sound. (DEP file photo)

How Healthy is Long Island Sound?

by

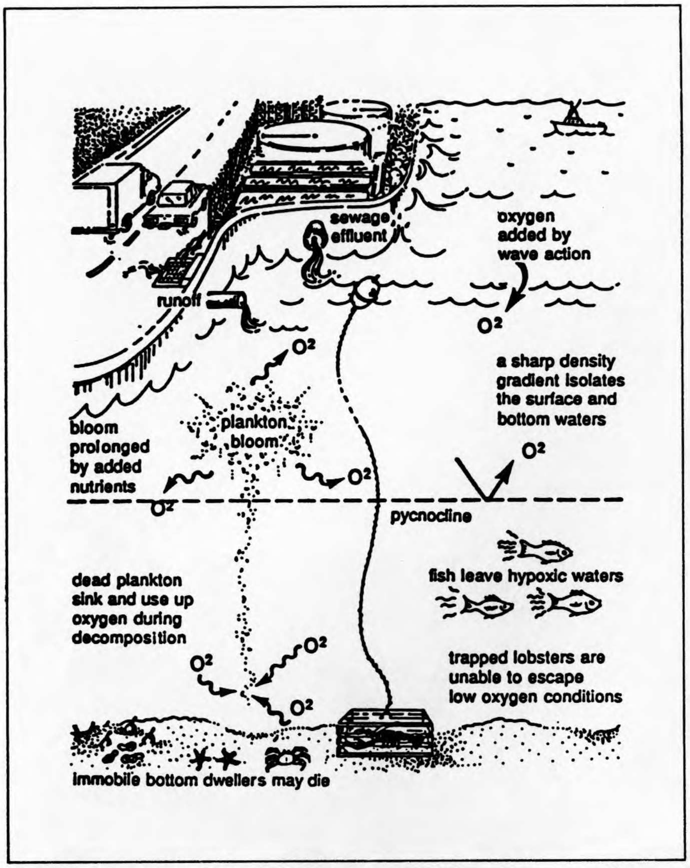
Julie A. Linden

Environmental Intern

RECENT MEDIA COVERAGE has portrayed Long Island Sound as severely polluted or even dead. Unfortunately, stories about beach closings and fish kills have taken the spotlight away from the more positive Long Island Sound stories. It is true that water quality in the Sound is poor, particularly in the summer months, yet the Sound still supports a multitude of uses. In fact, its shellfishing industry is the only one in the country that is currently expanding. Therefore, Coastweeks '90 challenges us to take a hard look at the health of our Sound and to think about positive remedies to some of its ills.

In order to do this, one must go beyond the scope of media coverage of LIS events to the long-term planning efforts of the DEP, Environmental Protection Agency (EPA), and other organizations.

Perhaps the most extensive effort on Long Island Sound is the six-year Long Island Sound Study being conducted by the states of Connecticut and New York and the EPA. This Study is examining issues related to water quality in the open waters of Long Island Sound. This effort, which is now in its fifth year, will culminate in the development of a Comprehensive Conservation and


sewage effluent
oxygen added by wave action
runoff
O²
O²
a sharp density gradient isolates the surface and bottom waters
bloom prolonged by added nutrients
plankton bloom
O²
O²
O²
pycnocline
fish leave hypoxic waters
dead plankton sink and use up oxygen during decomposition
O²
O²
O²
trapped lobsters are unable to escape low oxygen conditions
immobile bottom dwellers may die

The dynamics of hypoxia in Long Island Sound. (From LISS Fact Sheet)

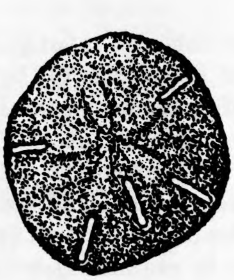
Management Plan (CCMP). The CCMP will focus on five subjects: Hypoxia (or low dissolved oxygen), Living Marine Resources, Toxics, Floatables, and Pathogens. Each module will describe and quantify problems and advance solutions. Of the five subjects, hypoxia has been identified as the issue of primary concern. Early research indicates that hypoxia has the largest impact on water quality in Long Island Sound. The preliminary hypoxia management plan is scheduled for release this fall. It will contain a status report on the occurrence of hypoxia in Long Island Sound and interim recommendations that may be carried out to prevent the situation from worsening while the final plan is being completed.

HYPOXIA IS A CONDITION in which the level of dissolved oxygen (DO) in the water is reduced to the point that marine life literally have trouble breathing. As the condition worsens and the DO level drops, some marine life migrates into an area of water with a higher DO level. Others, such as shellfish, cannot move away. In the worst case, these marine creatures suffocate and die. The fish kills and dead lobsters pulled up in fish trawls, as seen during the summer of 1987, are grim evidence of the danger posed by hypoxia.

Hypoxia is generally seen during late summer when the temperature is warmer and the sun stays out longer. These conditions, combined with the presence of a large supply of nutrients, are ideal for explosive growth of marine algae. These massive growths, often referred to as algae blooms, start a process that results in hypoxic conditions.

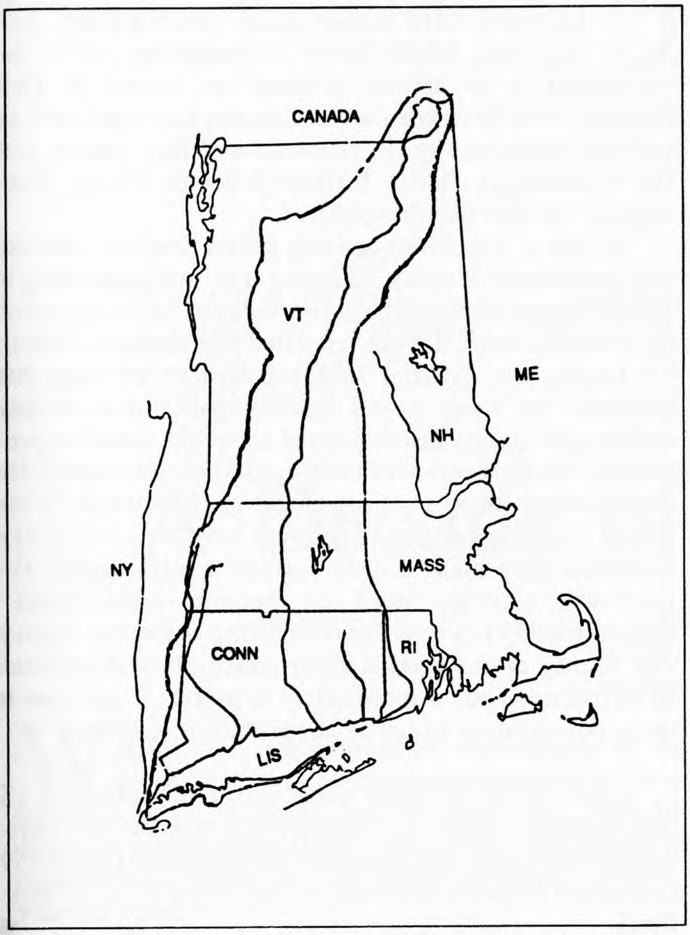
Algae grows in the warm surface waters of the Sound fueled by excessive nitrogen. It then dies, sinks to the bottom and decays, using up more oxygen in the decomposition process and creating a hypoxic zone. The surface water DO levels are replenished through contact with the air and photosynthesis, but it takes longer to restore DO levels in the colder, deeper waters of the Sound (below the level called the pycnocline).

Although algae blooms and subsequent hypoxia occur naturally in marine environments, particularly during the summer, their frequent and extensive occurrence in Long Island Sound is stimulated by the presence of excessive amounts of nutrients. These nutrients, primarily nitrogen, do not get completely removed from sewage during treatment and are present in great quantities in treatment plant effluent.



APPROXIMATELY ONE BILLION GALLONS of treated sewage are discharged to Long Island Sound each day. Other significant sources of these nutrients are non-point sources (NPS) such as atmospheric deposition and stormwater runoff.

NPS sources are so named because they do not enter the Sound directly, through a pipe, as sewage effluent and industrial discharges do. The Study is looking at all of these sources and is developing water quality and water



The drainage basin of Long Island Sound includes 15,820 square miles.

circulation models to determine the potential effects of various cleanup and management strategies. The models are based on data taken from various points in the Sound. Preliminary data show that the lowest DO levels occur in the western part of the Sound, off Hempstead Harbor, and that highest DO levels are found in Eastern Long Island Sound, near the race.

Toxic contaminants, pathogens, and floatable debris are three other issues to be addressed in the CCMP. Although isolated toxic spills, beach closures, or the discovery of abnormally high levels of floatables have attracted the most attention, Long Island Sound Study scientists have determined that these issues are not of as great concern in the open waters of the Sound as hypoxia is. The final plan will include strategies for preventing or containing incidents as well as other pertinent information.

Living marine resources are also being evaluated as part of the Study. This information will be used to establish baseline population numbers for assessing the long-term health of the Sound and the impact of water quality improvement actions.

IN ADDITION TO THE OPEN WATERS research being conducted as part of the Long Island Sound Study, the Connecticut DEP is working to assess the health of the near-shore waters off Connecticut's coastline. In particular, two programs are the backbone of this effort: the harbors waste load allocation program and the in-shore finfish survey.

The purpose of the harbors waste load allocation program, being conducted by the Bureau of Water Management, is to establish the maximum amount of pollutants that can be discharged into a harbor without significantly degrading water quality. To date, nine harbors have been studied: Greenwich, Stamford, Norwalk, Bridgeport, Black Rock (Bridgeport), New Haven, Clinton, Mumford Cove (near Groton), and Mystic. Mystic Harbor was studied because its waters are high quality and Mystic is considering a sewage treatment plant expansion. The goal is to ensure that these expansions maintain the excellent water quality in the harbor. The other harbors have all experienced problems with low DO levels. DEP is currently developing water quality models and waste load allocations for each harbor (New Haven is collecting the necessary data through a private contractor). This program has already been implemented, with great success, in some upland rivers and streams. It is anticipated that this program will have a similar effect on the water quality of these harbors.

The in-shore finfish survey, being conducted by the Bureau of Fisheries and Wildlife, is an extension of the survey being conducted in the open waters of the Sound, and will establish baseline data on fish populations and general ecological health. This data will continue to be collected and used to assess the impact of water quality improvement measures.

Research being conducted on Long Island Sound confirms that the Sound is still a vital and productive resource, one that can be enjoyed by a wide array of users – from fishermen to sailors, from bathers to shippers. This research also points out serious concerns including exces-

sive nutrients, population growth along the shores, and development. These concerns are of such a scale that they need to be addressed immediately on the state and federal level. However, the success of these programs relies on having these issues addressed by each of us as well.

On the state and federal level, substantial amounts of funding and staff effort have been used to upgrade sewage treatment plants, restore sensitive habitats, protect endangered species, develop land-use and harbor management plans, and regulate recreational use of the Sound. More needs to be done and DEP is currently in the midst of developing a Department-wide Long Island Sound Management Strategy which will establish a comprehensive approach to Long Island Sound issues. This strategy will help DEP coordinate priorities among the various sections of the agency and better present information to the public.

There is also a great deal of activity on the local level. Three regional Long Island Sound Councils, established by the General Assembly last year, have been meeting since June. During the course of this year they will develop plans containing regional Long Island Sound management priorities which will be presented to the General Assembly for consideration in upcoming legislation. Each council is composed of municipal officials, environmentalists, academicians and business-people. The councils get feedback from citizens and other Long Island Sound activists and draw upon their own expertise in developing these plans.

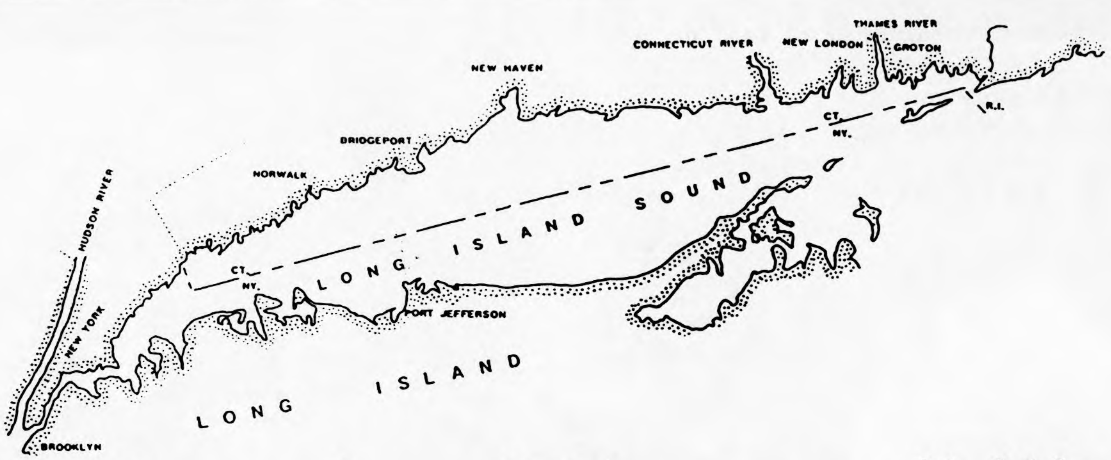
CLEARLY, THE LONG-TERM CHALLENGE facing Long Island Sound is sustaining public involvement in the efforts to clean and protect it. This summer there have been several citizen hearings, such as the ones conducted by the National Audubon Society and the Connecticut Public Interest Research Group.These types of forums should continue.

It took a long time for Long Island Sound to become as degraded as it is today. Cleaning it up and preserving it won't happen overnight, or just because we're aware of the problem, but will take concerted and sustained action.

During the National Audubon Society hearings this summer, the Long Island Soundkeeper Terry Backer called upon all citizens concerned about the Sound to prepare for the long period of cleanup that is now needed. He also called on them to change some of their ways. In his words, "Long Island Sound activists have been acting like sprinters--they make a hard push on specific issues. Tomorrow's activists need to become marathoners." Coastweeks'90 is a time for celebrating the value, beauty and bounty of our marine environment. It is also a time to reflect upon our responsibility to protect it and pass it on to our children in better shape than it is today.

Coastweeks '90 takes place between September 15 and October 8, 1990. For further information on Coastweeks '90, contact Peg Van Patten at Sea Grant (445-3459 in Groton) or Sarah Wade at the DEP (566-5524 in Hartford). ■

The health of Long Island Sound has an immediate impact on the creatures that live in and around it.(DEP file photo)



A Decade of Responsibility

by
John B. Larson
President *Pro Tempore*
Connecticut State Senate

WHILE THE 1980s might be remembered as the decade that the environment fought back, we in Connecticut are working hard to make the 1990s the decade of responsible public policy which will guarantee the safety and preservation of our environment for many years to come.

In particular, we have made the restoration and protection of Long Island Sound one of the General Assembly's highest priorities.

In the Senate, our critical work on Long Island Sound began in 1989, with the establishment of a Long Island Sound Cleanup Account within the state's Clean Water Fund. Initiated in 1986 by Governor Bill O'Neill, the Clean Water Fund was designed to improve the water quality of Connecticut's lakes, waterways and estuaries.

In 1989, we added $100 million to the Clean Water Fund and $25 million to the new cleanup account. In 1990, even though we faced a difficult fiscal situation, we fought for and won an additional $25 million for the Clean Water Fund.

The cleanup funding is, in large part, financing improvements to sewage treatment plants and related facilities which cause much of the pollution to the Sound. The money also is being used for research, dredging, improvements to coves, embayments and coastal wetlands, and other water quality programs.

Additionally, in both 1989 and 1990, the General Assembly appropriated $84,000 for Long Island Sound research and $47,300 to support a library and information clearinghouse on Long Island Sound based at the University of Connecticut's Avery Point facility.

Realizing that the money does not solve every problem, the General Assembly also passed legislation designed to ensure better coordination and sharing of resources to combat the problems affecting Long Island Sound.

Thanks largely to the efforts of State Senator John Atkin (D-Norwalk, Darien), the Bi-State Long Island Sound Committee including Connecticut and New York was formed in 1989. This joint partnership continues to address the problems on both sides of the Sound.

In 1990, Senator Steve Spellman (D-Pawcatuck) and I introduced legislation creating the Long Island Sound Assembly which consists of three advisory councils, one each for the eastern, central, and western portions of the Sound. The assembly and councils are working to coordinate state and federal laws and activities regarding the Sound and, in conjunction with the Bi-State Committee, the Assembly will be submitting its recommendations to the Legislature on January 1 and we will take action on those recommendations during the 1991 session.

Other steps taken to aid Long Island Sound include: regulating sewage discharge from vessels; securing $1 million in state bond money for flood control and shore erosion projects; $1 million in state bonding for the seeding of shellfish grounds; requiring the DEP to develop and implement an oil spill contingency program with local officials; improving state regulation of dredging and structure erection in coastal waters; $1 million in state bond money for the Smith Cove Feasibility Study; $350,000 in state bond money for the Quinebaug Valley Fish Hatchery; and $50,000 in state bond funds for the Aquaculture Testing Laboratory in Milford.

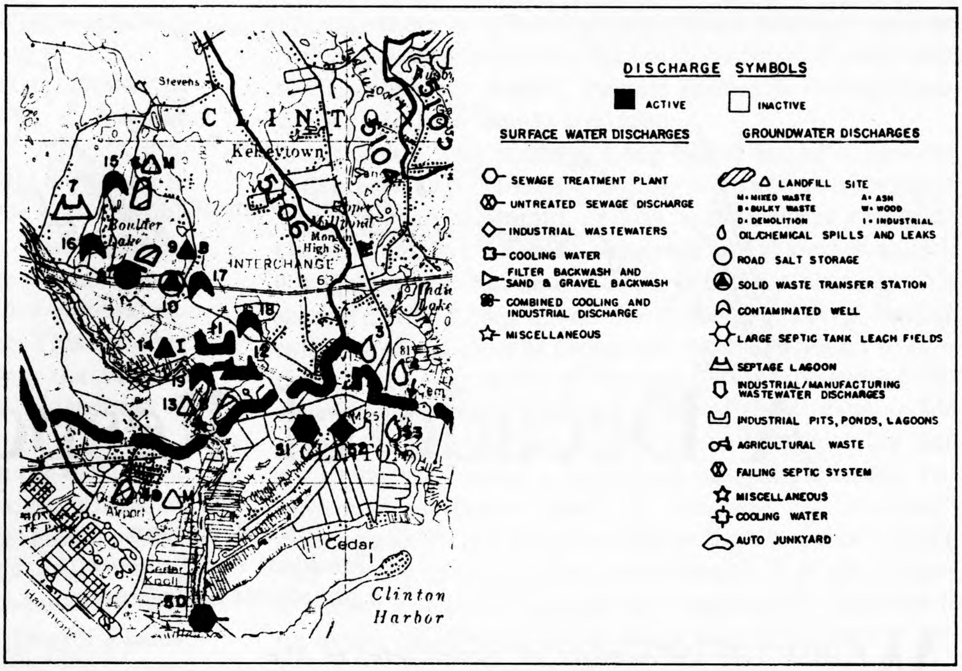
In summation, the legislative action taken by the General Assembly in 1990 was impressive enough to earn praise and high grades from Connecticut's Coastal and Clean Water coalitions.

I am very proud of the accomplishments we've made at the legislative level on behalf of Long Island Sound and all Connecticut residents who enjoy its beauty and resources. Hopefully, everyone will recognize and accept a role in protecting and preserving it for future generations. ■

Map of the Month

Not Pretty but a Great Personality

by
Alan Levere
Senior Environmental Analyst



Details from the DEP's Leachate at Wastewater Discharge Source Map.

ONCE IN A GREAT WHILE I find myself on the speaking end of a map and publications presentation. One of the maps I enjoy perusing of a crisp Autumn night, and one which apparently many other people have found fascinating, is one which I would have to describe as "not too pretty."

Like all the maps we have, it is full of statewide information. The problem here, however, is that most of the information is the kind you would probably rather not know. But, as we environmentalists have painfully discovered, ignorance tends not to remain blissful.

So, if you are like most of our readers, you will want to know all things, pleasant and unpleasant. We are confident this map will be of interest to you. It is the Leachate and Wastewater Discharge Sources (LWWDS) map.

Actually, it is more than one map because at the scale of 1:50,000 it takes eight maps to get coverage of the whole state. The set is divided up into drainage basins with the major, regional and sub-regional levels being depicted. Because the information is updated at regular intervals the maps are avilable in blue print format.

The eight sheets are the upper and lower for the Housatonic, Connecticut, and the Thames Rivers, with the Southwest and South Central coast sheets rounding out the set. The Southeast Coastal basin is on the Lower Thames sheet.

The whole message of these maps is to show the known pollution sources as they appear on the landscape. This is done with a series of symbols that represents more than 20 types of known surface and groundwater man-made pollutants. Among these are the locations of the dumps that handle our daily waste, the junk yards that take our old vehicles, the streams that take our processed waste water and the road salt storage areas that help to keep our roads ice free in winter.

No one could possibly know all the locations of all the discharge points in the state. Still, the map set depicts all surface and groundwater discharges which: (a) have received a wastewater discharge permit from the state or (b) are historic and now defunct waste disposal sites or (c) are locations of accidental spills, leaks or discharges of a variety of liquid or solid wastes.

The maps will give you a good idea of what pollution sources occur in which river basin systems. This is especially applicable since manufacturing was historically located in close proximity to a water course, and there are rivers that now show up as heavily polluted as a result of the various industries.

Each symbol on the map has a reference number next to it. You can look each number up in the LWWDS book that accompanies each map. Here you will be able to find out a little more information about the discharge source.

So how is it I have fun with this map that seems to bear so much bad news? Well, the beauty of the map is that we know what and where so many of these pollution sources are located. And it is exciting to think that with the knowledge of so many of these environmental problems in hand, we can plan accordingly for the future -- without a whole state full of surprises every time we need a location for clean water or land.

As you might guess, these maps go hand in hand with the water quality maps printed at the same scale. Where you see intense pollution on the LWWDS maps, you will no doubt find a degraded classification on the water quality map.

The LWWDS maps are $2.50 per sheet or $20.00 for the set of eight. The set of eight water quality maps is also $20.00.

To order, please include $2.00 for shipping and handling per order and eight percent Connecticut sales tax. Our address is: DEP-NRC, Map Sales, Room 555, 165 Capitol Avenue, Hartford, CT 06106. ■

Bob Fritsch sees his mission as protecting the precarious survival of the timber rattlesnake in Connecticut. (Photo: Edith Royce Schade)

A Symbol of True Wilderness

Bob Fritsch on Connecticut's timber rattlesnakes

(The following interview with Robert Fritsch, a well-known Connecticut herpetologist and environmentalist, was produced as part of the Environment *television series.)*

CE: How would you characterize your mission in regard to insuring the survival of the timber rattlesnake?

RF: We try to educate and help people to consider another way of looking at these animals, that they're not necessarily the threat they were thought to be.

CE: To see these creatures in the open is a remarkable experience. Certainly they are creatures of nobility and dignity, and really are magnificent.

RF: That's the way I see them. I see them as a necessary part of a larger picture. I see the life of the rattlesnake as very interesting, but fraught with difficulty. The timber rattlesnake has to be a survivor in the true sense of the word.

CE: Why is the rattlesnake so vulnerable?

RF: The rattlesnake is vulnerable because it's a creature of preferred habits – critical habitat and a very narrow feeding preference. It's not successful with change and so, therefore, we think that we have to help.

CE: What do you do to help this creature?

RF: To begin with, Richard Peterson, Michael Clemens, and I, and others, felt that there should be protection for *all* wildlife in Connecticut. The terminology used in the statutes is *ferae naturae*, "wild by nature," and we believe that wild non-game animals as well as game animals should be protected. Whether the animal is popular or unpopular shouldn't matter. If the animal is a declining species, then the animal should be afforded protection. One of the key statutes involving the scope of regulations with the DEP was amended to include all wildlife, not just gamebirds and wild quadrupeds, as originally written.

CE: So your voice was heard. What kind of research are you involved in?

RF: The timber rattlesnake is very secretive, a risk avoider. New information doesn't come easy, but like all good information, it's very rewarding. It involves man-hours, telemetry, and a holistic approach. We try to see what the rattlesnake is doing within the larger ecological picture.

CE: To what end is all this research?

RF: To better enable the state to manage this animal, and to educate the public. Communication over time will pay off.

CE: You are very reluctant to disclose specific information about the rattlesnake. Why is that?

RF: The rattlesnake is very vulnerable. It's a declining species. It's not found everywhere. There are people who would use this information to the detriment of the rattlesnake and, quite frankly, we're concerned. We have to be very careful what we say and what information is disseminated.

CE: So many people fear and hate the rattlesnake. Why do you think that is?

RF: I believe that it's learned behavior. The snakes have not always fared so badly with man. It's only in the Judeo-Christian era that this has come about – the snake in the guise of the devil. I prefer to think of the snake as symbolic of cleanliness, purity, a good harvest, as it was back in the Egyptian days. I see the animal as a species that's just trying to survive, and it certainly doesn't want trouble with mankind. It avoids man as much as it can.

CE: What is so important about the snake that you would like to communicate to other people? Why save the snake?

RF: I think the snake is a symbol of true wilderness. If the snake is removed, then we are all diminished. And if an animal that has managed to survive over the past 12 to 13 million years is now not faring so well, a little enlighted action on are part might help.

CE: How long does a timber rattler live?

RF: If left alone, in its natural environment, it has very few enemies once it reaches maturity. It could conceivably live 30 to 35 years or even longer.

CE: What does it eat?

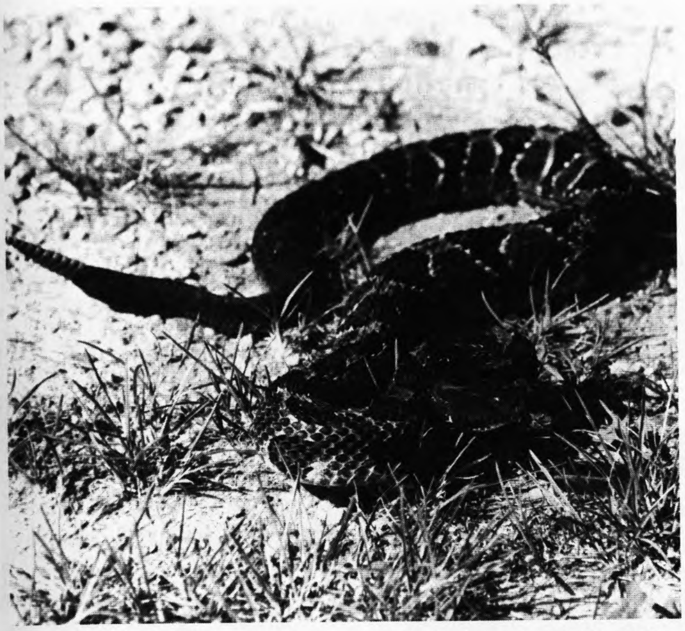
RF: It's a predator, and its principal prey is the white-footed mouse. It has been known to take the shrew. Opportunistically, it will take birds and other small rodents. But the white-footed mouse is its staple.

CE: It doesn't go out looking for other species. For example, human species.

RF: No, not at all.

CE: What about reproduction?

RF: The male rattlesnake reaches sexual maturity at his fifth year. The female reaches her maturity, starts "yolking up" (forming yolk masses) along about her sixth year. The seventh year she ovulates. She has mature eggs in her reproductive system, and at this particular time when she emerges from hibernation, she is ready to copulate with a male. Once conception takes place, there is a gestation period of from 64 to 72 days. They have their young at summer's end, normally mid-August to mid-September. Then they go off cycle again and the following year is their feeding year. During the season of conception, they do not eat. They go off feed. Prior to that, when they're yolking up, if they do feed, the feeding is less intense, more opportunistic. We're not sure about how much they do feed in that one year when they're yolking up or forming their yolk masses. But when they do become ready for conception and mating, then they don't feed at all. Once conception takes place there's no more feeding. So that third feeding year is critical for the female. The female has to feed voraciously on the



The timber rattlesnake has survived for about 12 million years. Now it will need some help if the species is to continue. (*Photo: L. L. Rue*)

white-footed mouse.

CE: And because of these off-year reproductive cycles, the population is very sensitive to any disturbance.

RF: Sure. If you have a population of rattlesnakes, any given season only a third of them are reproducing.

CE: What is thermal regulation?

RF: Thermal regulation is basically using the sun to raise or lower the body temperature. The snake is a cold-blooded animal; it doesn't have a furnace to keep up like we do. They use the radiation from the sun to raise their temperature. They can get into the shade if their core temperature gets too high, or they can retire down into the broken shade or perhaps even go under a rock. On a 96-degree day you won't find rattlesnakes, because that's a killing temperature. A lot of people think that snakes prefer warm places, but that's not so. They're intolerant of too much heat.

CE: How powerful is the venom of the rattlesnake and how does it work?

RF: The timber rattlesnake venom is quite strong, but of course it varies. It's a complex proteolytic substance that is toxic to the animals into which it is introduced intravenously -- not orally. It's a very vulnerable substance. The complex proteins can be changed very quickly -- particularly by digestive juices. Therefore this enzyme has to be introduced intravenously. In one sense it's hemolytic and hemorrhagic; that is, it bursts the red corpuscles in the prey animal and dissolves the walls, particularly of the capillaries. This is the beginning of digestion. Venom is a modified saliva, a precious substance to the snake. The snake does not waste it. It's used as a food-getting substance, and it's associated of course with the biting mechanism -- the fangs, the retractile fangs. And the snake uses it to secure its prey. People ask if the snake feeds on the little white-footed mouse, then why does the venom have to be so powerful? The reason is it has to have knockdown power. It's got to be able to knock this critter down, and keep it down. The snake is a relatively slow-moving animal and the animal that it preys on is a jumping and climbing mouse. So it has to be able to knock that mouse down. Unfortunately, that translates into potency, but that's the way it has to be. But I'd like to reemphasize, the venom is a modified saliva, not part of a defense mechanism. It's a food-getting mechanism that the snake values tremendously and it's not anxious to waste.

CE: You also emphasize that the snake is very reluctant to get into an aggressive posture, even that they're very gentle creatures.

RF: Aggression doesn't translate too well in terms of evolution. An aggressive snake is selected out. The rattlesnake, just like any other snake, would prefer to lie still upon the approach of any adversary. They are cryptically marked and colored, and they can blend right in with the colors of the forest floor. It is difficult to see the animal. And that's the way they prefer things. If worse comes to worst, they'll retreat, buzzing as they go.

CE: How do you respond when you receive calls from people who say a rattlesnake is in their home or their yard?

RF: We take these calls very seriously. We feel that the communication with the people is just as important as removing the snake. And during the course of removing the snake, education takes place. We explain what the snake is doing there and that the species has been there since perhaps the last glacier, 10,000 years ago. We explain that they are trying to get to their forage area and that they're not interested in causing any trouble with people.

CE: Why not just move the snake to another part of the state?

RF: Rattlesnakes imprint on the dens or in the areas of the dens where they are born. It's a very slow process; they get to know those areas well. They've hunted the terrain and worked the terrain. If you take the snake out of the original natural range and reintroduce it to another area, studies show that the animal is lost. It behaves as though it were lost. Its movements are tremendously different, more erratic, less methodic. And so we have a snake that will probably die by the time of the first frost. Certainly it would not get through the winter. We think the mortality rate may be 100 percent. That's what studies seem to indicate down in Pennsylvania.

CE: So to move a rattlesnake is really a death sentence. It's not compassionate.

RF: That's correct.

CE: What kind of progress do you think you have made in Connecticut in the past few years since you have been working with this issue?

RF: I think it's been very worthwhile. People have at least tried to understand what we were saying, they learned a little bit about this animal. We feel over time we have made progress not only in protecting the snake through regulation as an outgrowth of the legislative process, but also we have increased the acreage of the state forest, the public holdings in Glastonbury not just for the rattlesnake but for every living thing in there – bobcats, vultures, Canadian warblers, worm eating warblers, coyotes, and many other animals that we have been able to identify in there. It's all part of the rattlesnake being a part of a greater picture.

CE: To what extent is the rattlesnake now legally protected in Connecticut?

RF: Our initial legislative success as we said was the amendment which broadened the scope of regulations to include all wildlife, not just some of the wildlife. As an outgrowth of that we have the regulatory agency, the DEP, able to protect non-game wildlife. We now are eager to participate in the formulation of the status language hearings that are coming up, which involves the state's ability to define and list endangered and threatened species. This will give such status not only to the rattlesnake, but also other animals – the bog turtle, the spade-foot toad, and some others.

CE: What is the future of the rattlesnake in Connecticut? Is it safe?

RF: That's a very difficult question to answer. The future of the rattlesnake is contingent on its ability to have the great ranging grounds that it needs. And without those open spaces, all the laws in the world are not going to protect this animal. Without these woodlands a lot of creatures are going to pass by the boards. It's good for people too to be able to get out and enjoy our state forests.

CE: How closely related are the health of the state and the survival of the rattlesnake?

RF: The rattlesnake is a good litmus test for our attitude and our priorities. The timber rattlesnake is a venomous animal. It's venomous because that's the only way it can get its food. It was made venomous through evolution, Mother Nature. Unfortunately, we've been conditioned to look at that as some type of evil. But, if we can lay that aside, we can see the rattlesnake as one part of a bigger picture, an environment and all the creatures living within it.

CE: What final thought would you want to communicate?

RF: I would hope that people look at this animal and perceive it as part of an interlocking picture where one part is related to all other parts, and see these plants and these animals from that standpoint. Each species needs the other and each species helps the other. I would hope that people realize that we are a part of that picture too whether we like it or not. And if we can understand that, I think that this will go a long way in making this world a better place for all of us to live.

The timber rattlesnake, far from being aggressive, seeks to avoid trouble. It would rather go on its way, buzzing as it goes. (Photo: L.L. Rue) ■

The Natural Historian

The northern copperhead (Agkistrodon contortrix mokasen) *is one of two species of venomous snakes in Connecticut. It is not aggressive and very rarely bites people. Copperheads are seldom seen, partly because of their color pattern. (Photos by Linda Krulikowski)*

Where the Snakes Go in Winter

by
Carol Davidge
Public Information Coordinator
Connecticut State Museum
of Natural History

IN THE FALL, snakes choose a home here they will hibernate through the winter. Because reptiles are cold-blooded, they need warmth to heat their bodies so they can move around. Before it gets too cold and their movements become so slow that they can no longer effectively hunt for food or escape predators, snakes find a safe place to become inactive.

Since snakes freeze to death in very cold weather, they try to find hibernacula where temperatures stay around 45 degrees Fahrenheit or higher. Usually they share a den with other snakes in rock ledges, under rotting logs, or in caves. Snakes are fully active only during warm weather -- in Connecticut, five to seven months of the year, from April through October.

Immediately after moving into their winter homes, snakes may come out to sun themselves on warm days. Once cold weather sets in, however, they don't leave their dens. The young may hibernate with adults or find a spot to share with many other snakes of the same size -- not necessarily of the same species.

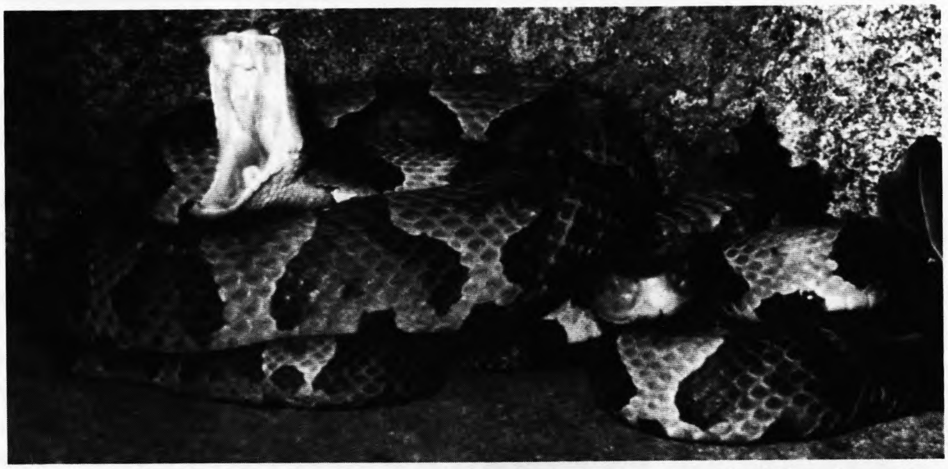
Very little is known about the hibernation of semi-aquatic freshwater snakes, although most studies indicate that they spend the winter on land, within 400 meters of water. In a few cases, both land and water snakes are known to have spent the winter under water in bottom sediment, which remains warmer than the air. These snakes survive by absorbing oxygen from water through their large intestines.

When spring arrives, snakes come out of their dens from time to time to bask in the sun. In mid- spring, with sustained warm weather, they leave their dens to return to summer foraging grounds.

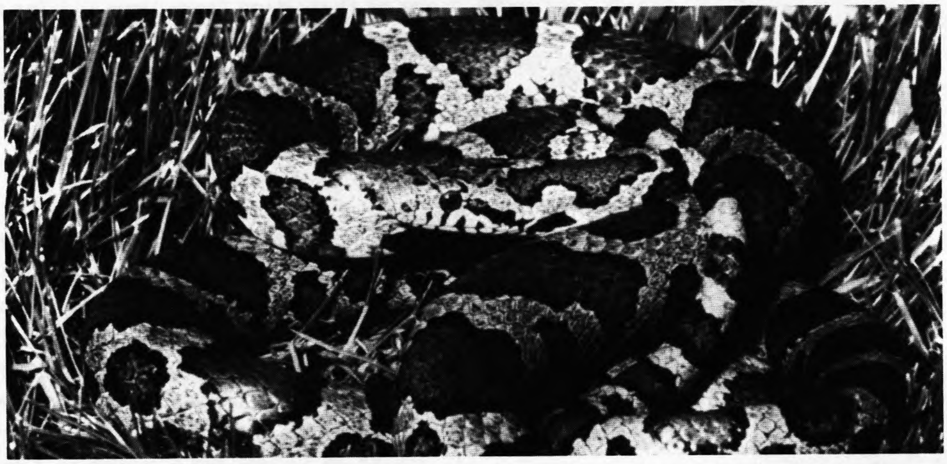
OF THE 14 SPECIES of snakes that live in Connecticut, only two are venomous: the timber rattlesnake (*Crotalus horridus*) and northern copperhead (*Agkistrodon contortrix mokeson*). Nonvenomous snakes may have painful bites, but it is very rare to be bitten by a snake in Connecticut without picking it up or provoking it in some way.

Timber rattlers enter their dens from September to October and emerge again in early May. The hibernaculum is most often along a traprock ridge with steep ledges and rock slides. The dens usually face south, southwest, and southeast, thus catching the most sunlight. Rattlers travel up to two miles from their den in the summertime.

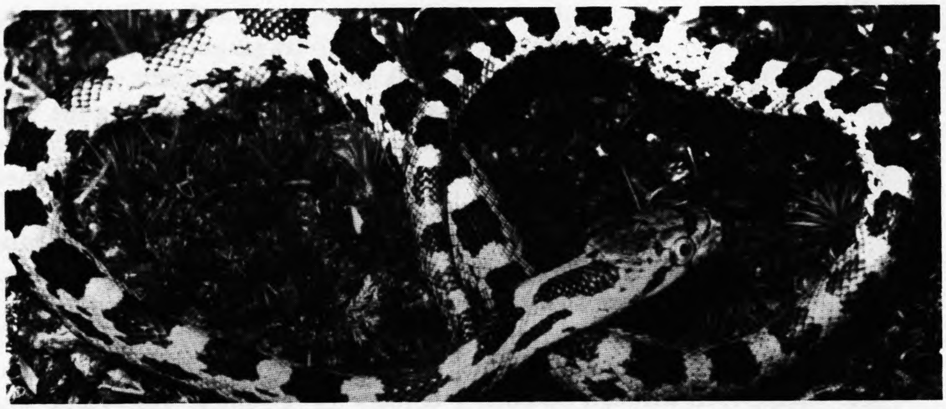
Northern copperheads also enter their dens in September and October, and have been seen emerging as early as April 12 or as late as May 23. Their dens are on wooded hillsides or along borders of swamps, reservoirs, and streams. Copperheads prefer traprock (basalt) ledges with cavities scattered throughout. Sometimes they share a den with black rat snakes.



These northern copperheads are outside their den on a rock slide where they spend the winter. Snakes frequently bask in the sun which raises their body temperature and permits faster activity. The snake with its mouth open is adjusting its jaws which normally are dislocated when it swallows large prey.



The eastern milk snake (Lampropeltis triangulum triangulum) *may be found near barns where rodents are common, but it is completely untrue that these snakes milk cows. Milk snakes are frequently mistaken for copperheads. Compare the light blotches which include a "Y"* or *"V" shaped mark at the back of the head with the more uniform color of the head of the copperhead.*



The young black rat snake (Elaphe obsoleta obsoleta), *with its distinct pattern, is often mistaken for venomous species in Connecticut. When mature, the snake is uniformly black on the dorsal surface. Notice the round eye pupil, a characteristic of nonpoisonous snakes.*

AMONG CONNECTICUT'S nonvenomous snakes, the eastern milk snake (*Lampropeltis triangulum triangulum*) hibernates under floors as well as in abandoned basements, stone crevices, rock ledges, barns, sizable log piles, rodent holes, and debris.

Small milk and garter snakes have even been found in insulated walls of houses. Eastern garter snakes (*Thamnophis sirtalis*) are very adaptive, making winter shelters wherever they find adequate warmth — in traprock slides with deep crevices, the warm peat of quaking bogs, mud, or log piles. They hibernate either alone or with others.

The northern ringneck (*Diadophis punctatus edwardsi*), northern red-bellied (*Storeria occipitomaculata occipitomaculata*) and northern brown (*Storeria dekayi dekayi*) snakes choose rocky outcroppings and log piles. Red-bellied and ringneck snakes also enjoy the moderate warmth of decomposing vegetative environments, such as compost piles and rotting log piles.

Eastern worm snakes (*Carphophis amoenus amoenus*) are opportunistic and make winter shelters in animal burrows and under rotting logs. Northern water snakes (*Nerodia sipedon sipedon*) prefer talus rockslides that are close to water.

Northern ribbon snakes (*Thamnophis sauritus septentrionalis*) seek loose rocks and streambeds that are sheltered from wind by heavy undergrowth. Eastern smooth green snakes (*Opheodrys vernalis vernalis*) hibernate in rotting tree trunks or under man-made shelters such as stone walls and log piles.

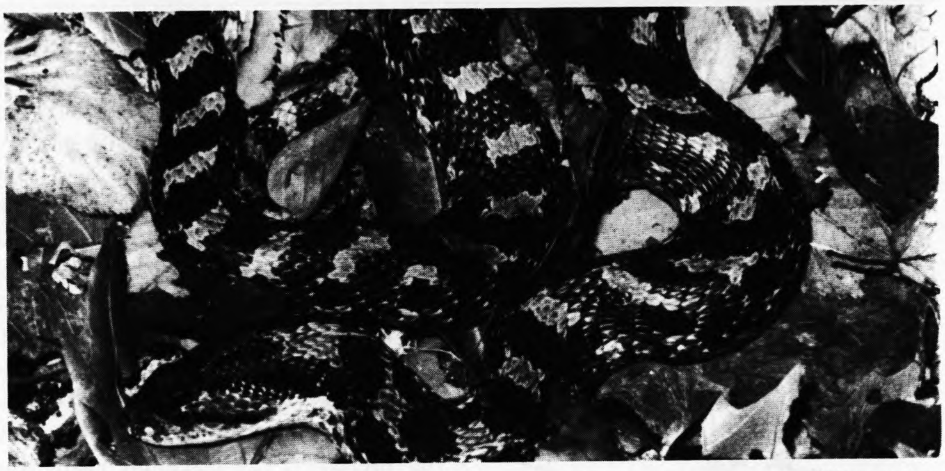
The eastern hognose snake (*Heterodon platyrhinos*) doesn't hibernate in communal dens, but chooses to spend the winter alone, deep in sandy loamy areas and sometimes in rodent burrows or ant hills.

Northern black racers (*Coluber constrictor constrictor*) and black rat snakes (*Elaphe obsoleta obsoleta*), sometimes called pilot black snakes, may be found in barns and animal burrows, but most often seek rocky outcroppings, sometimes sharing a den with venomous snakes. Even though black racers eat young rattlers and copperheads during the active period, the three species hibernate peacefully.

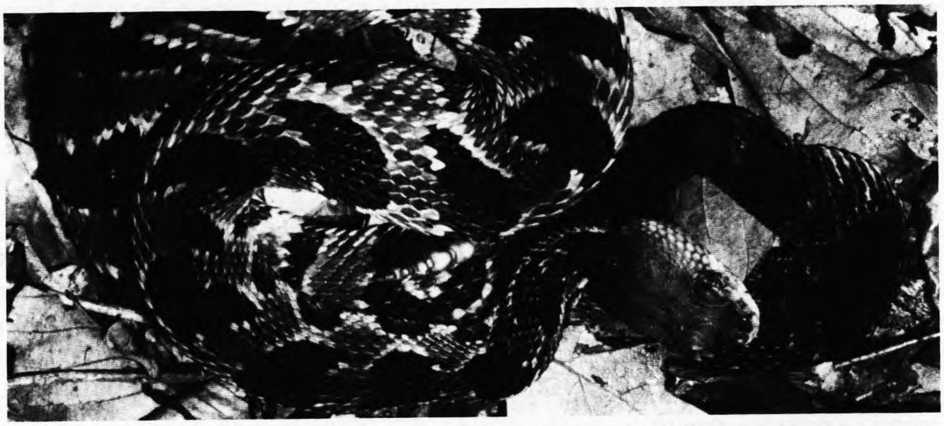
Humans should not kill or harass snakes because they consume rodents and other pests, thus making an important contribution to the environment. They are among nature's most fascinating animals because of their unusual locomotion, history, and behavior. Venomous snakes are valuable in medical research.

More information about Connecticut's snakes will be found in *Connecticut's Venomous Snakes* by Richard C. Petersen and Robert W. Fritsch, which may be ordered from the Connecticut Geological and Natural History Survey, DEP, Hartford, CT 06106. "Venomous Snakes of Connecticut and their Look-Alikes," a Connecticut State Museum of Natural History traveling exhibit, is available for loan to schools and others by contacting the Museum of Natural History at UConn, Box U-23, Storrs 06269-3023 phone:(486-4460).

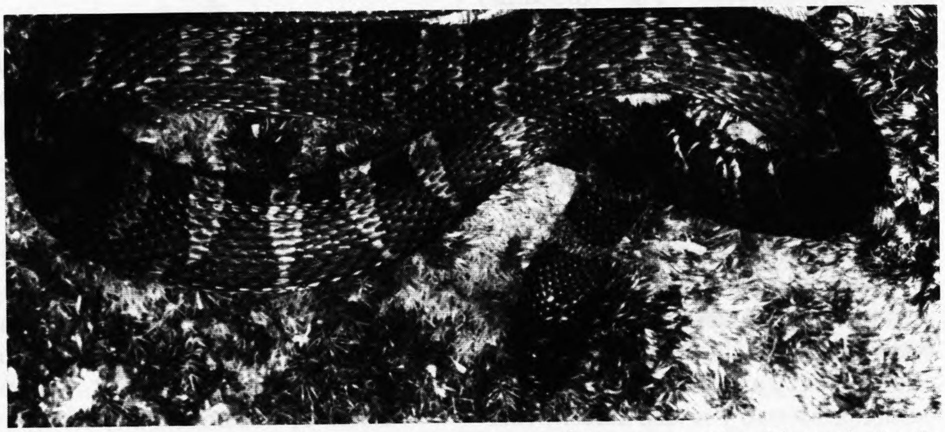
This article was contributed by The Connecticut State Museum of Natural History at The University of Connecticut in Storrs, which exhibits mounted birds of Connecticut, the largest mounted white shark on display in the eastern United States, "Videoplace" interactive video, Indian artifacts, and offers programs for teachers, children, and adults. For information, contact the Museum, UConn Box U-23, Storrs, CT 06269-3023; phone (203) 486-4460.



The upturned mouth distinquishes the eastern hognosed snake (Heterodon platyrhinos) *from all other snakes in Connecticut. When discovered, hognosed snakes will hiss, flatten their head and neck, roll on their back and play dead. This unusual display may frighten some potential predators but may also cause people to kill this nonpoisonous snake.*



The color pattern of the northern timber rattlesnake (Crotalus horridus horridus) *helps conceal it from danger and makes it difficult for prey to detect it. In Connecticut, there are two color forms, yellow and black. The scales in the foreground show keels, an important feature in snake indentification. Note the rattle on the end of the tail (center of photo).*



Northern water snakes (Natrix sipedon sipedon) *have considerable variation in their color pattern. The diamond-shaped markings cause some people to mistake this species as poisonous. Water snakes are seen in and near water and are known to be aggressive biters when picked up.* ■

For Your Information

Mercury in Paint-Facts for Consumers

THE ENVIRONMENTAL PROTECTION AGENCY (EPA) is concerned that paints used indoors which contain mercury may present health risks both to people who apply the paint and to people who occupy painted rooms, especially children. The companies that produce mercury for use as a biocide in paint have agreed to eliminate future use of mercury in interior latex paints. Approximately 25 to 30 percent of interior-use latex paints currently contain mercury.

Mercury will still be used in some paints for outdoor surfaces. However, all these paints produced in the future will have a statement on the label that warns painters that the product contains mercury and should be used only outdoors. Mercury is also used in various miscellaneous interior products such as spackling and patching compounds, joint compounds, adhesives, and acoustical plasters.

EPA will continue to examine the potential risks of mercury and will take further action, if necessary, to protect the health of consumers and their families.

EPA believes that it is preferable that consumers use paints which do not contain mercury when painting indoor surfaces. Effective on August 20, all further production of paints containing mercury must be labeled exclusively for exterior use. To deal with existing stocks of paint containing mercury, the National Paint and Coatings Association is working with paint manufacturers to relabel all paints with higher mercury levels (over 200 ppm) for exterior use only. EPA believes that consumers may continue to use interior paint with lower mercury levels (200 ppm or less) without unreasonable risk if they follow all label directions and use the following precautions:

- Ventilate the area throughly by opening windows for as long as possible and practical. If possible, place a fan in or near an open window to enhance circulation and draw the paint fumes outside.

- Tightly seal any unused cans of paint and store them out of the reach of children until they can be disposed of properly.

Symptoms of mercury poisoning can intensify and may become permanent as exposure time and/or concentration increase. These symptoms, which could be reversed with proper treatment, include:

- Slight tremors, particularly affecting the hands and interfering with fine motor control such as handwriting; erethism, a syndrome characterized by various levels of insomnia, shyness, and emotional instability; decreases in motor function and muscle reflexes; short term memory loss; headaches; and abnormal EEGs (a graphic record of the electrical activity of the brain).

- In children, severe pain in the extremities; pinkness and peeling of the hands, feet, and nose; irritability; sweating; and a rapid heartbeat. These are symptoms of acrodynia, a rare form of childhood mercury poisoning. Two separate cases of acrodynia have been diagnosed in two children whose homes had been painted with interior paint containing mercury.

If your house has recently been painted with mercury-containing paint and you believe you are experiencing symptoms of mercury exposure, consult a physician.

If you currently have paint that contains mercury and you wish to dispose of it:

- Do not pour leftover paint down the sink, drain, or toilet.

- Contact the household hazardous waste collection program in your community to see if they will accept paint. To find the location and hours of operation, contact Leslie Lewis at the DEP at 566-5125.

If you want to know whether the paint you have or plan to purchase contains mercury call the National Pesticide Telecommunication Network (NPTN) toll-free at 1-800-858-7378, 24 hours a day, seven days a week, or the DEP's pesticide control unit at 566-5148, or an EPA Regional Office.

1990
Legislative Summary

A review of the past year's new environmental laws

by
Elaine Korenkiewicz
Legislative Coordinator
and
Michael Sullivan
Executive Assistant
Drawings by
Michael Klein

(The following is a summary of environmental legislation passed in the 1990 session of the Connecticut General Session. This is the first of a series.)

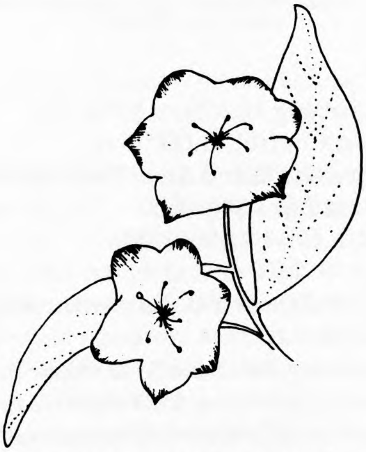
I. GENERAL

1) PA 90-231 — AAC (An Act Concerning) Funding Fees for Environmental Programs

The act establishes two dedicated funds, the "Environmental Quality Fund" and the "Conservation Fund," to provide funding for staff and associated expenses in the DEP. New fees, as well as increases in existing fees, will be deposited into these two funds to hire 73 additional staff. Fees under both funds are expected to generate $3.5-4.5 million.

The Environmental Quality Fund, effective July 1990, will receive fees from a variety of air, water, and waste programs for one to five years. The Conservation Fund will receive new or increased fees from a variety of park, fisheries, and wildlife fees.

Task Force. The act establishes a broad-based task force to study the fees, adoption and implementation methodology, the units to be staffed, other revenue sources, collection, program services efficiency, Thomas Commission's recommendations, performance and physical facilities. The task force will report to the General Assembly in February 1992, with an interim report due by January 1991.



The Mountain Laurel
(Kalmia latifolia)

State Flower of Connecticut

Effective Date. July 1, 1990, except for the provisions regarding the Conservation Fund, which are effective on passage.

2) PA 90-77 — AAC Evaluation of the Cumulative Effects of Chemical Discharges

Factors. This act requires the Connecticut Siting Council to consider additional factors when reviewing applications to site various facilities, including:

a) other locations;
b) proximity to schools; and
c) data on discharges of toxic substances.

The Council also must determine the proposed facility's probable health impacts.

Effective Date. October 1, 1990.

4) PA 90-110 — AAC Prosecution of Environmental Matters

This act requires the chief state's attorney to assign at least one assistant state's attorney and one inspector to handle all criminal environmental cases. The act takes effect on October 1, 1990.

5) SA 90-25 — AAC Recommendations of the Indian Affairs Task Force

Report. This act amends P.A.

89-368 by adding areas of study and extending the deadline for the Task Force on Indian Affairs. Under this act, the Task Force shall make recommendations regarding the issue of sovereignty, the trust agreement process, and the definition of the term "care and management of reservation lands."

The Task Force also will review the role and funding of the Indian Affairs Council, the application of the state sales tax to transactions on reservations, and the state's duties to native Americans who are not members of the indigenous tribes in an Indian Affairs Council. The Task Force shall submit a report by February 1, 1991.

Effective Date: October 1, 1990.

6) SA 90-18 — AA Making Appropriations for Expenses of the State for Fiscal Year Ending June 30, 1991

This act provides $38 million in appropriations for the DEP. In addition, the act contains the following specific provisions:

Underground Storage Tank Clean-Up Fund. The Finance Advisory Committee may transfer monies from this Fund to the Department of Human Resources to fund a low-income energy assistance program.

Long Island Sound. The unexpended balance from FY 90 shall not lapse and shall be transferred from DEP to the Committee on Legislative Management to fund the activities of the Long Island Sound Assembly and the Long Island Sound Councils.

Executive Assistants. After January 1, 1991, no state agency may employ more than one executive assistant.

Municipal Tipping Fee Fund. On July 1, 1990, the funds in the municipal tipping fee fund shall be transferred to the General Fund.

Individual Projects. The sum of $10,000 appropriated to DEP for Allyn's Brook Park shall be used for a grant to the town of Durham for the development of Allyn's Brook Park Recreation Area. The sum of $75,000 appropriated to DEP for Bridgeport flood control shall be used for a grant to the Lake Forest Association for expenses incurred on the Island Brook flood control project.

Effective Date: July 1, 1990.

7) PA 90-34 — AAC Authorization of Bonds for Capital Improvements and Other Purposes

a) *Capital Improvements* (Sec. 2)

Recreation and Natural Heritage Program $15,000,000
Dam Repairs $ 1,500,000
State-owned recreational and conservation areas $5,000,000

The Garnet

(Almandine garnet)

State Mineral of Connecticut

Quinebaug Hatchery $350,000
Flood Control $1,000,000
Sherwood Island State Park $650,000
Bolton Lake $800,000
Smith Cove $1,000,000

b) *Grants-In-Aid to Municipalities* (Sec. 2)

Recycling Facilities $14,000,000
Land Acquisition $5,000,000
Ansonia $2,000,000 (Recreational facilities)
Bridgeport $1,150,000 (Design and construction of flood control project in Northeast corner of city); $1,100,000 (Design and construction of Ox Brook flood control project)
Bristol $325,000 (Development of headquarters for Challenger program/Eastern Regional Little League); $100,000 (Dredging and improvements at Pine Lakes)
Clinton $200,000 (Extension of waterline for Nod Road)
Derby $2,300,000 (Renovations to the Green)
Durham and Middlefield $200,000 (Purchase of compactor and site preparation)
East Hartford $100,000 (Feasibility study and design of an area for nature conservancy and passive recreation); $2,000,000 (Purchase of land along old Rte. 291 corridor)
East Lyme $5,000,000 (Purchase of sewage capacity for Rocky Neck State Park); $250,000 (Completion of athletic field)
Enfield $100,000 (Development of a soccer field); $50,000 (Improvements to Crescent Lake and Shaker Pines Lake)
Hamden $150,000 (Storm damage/flood control at Colonial Drive)
Hamden and Cheshire $1,000,000 (Park developments or acquiring abandoned rights-of-way on Farmington Canal)
Hartford $2,750,000 (Improvements to municipal parks); $100,000 (Improvements to playground at McDonough School); $100,000 (Improvements to playground at Batchelder School); $100,000 (Improvements to Elizabeth Park); $250,000 (Recreational facilities at Charter Oak Terrace); $800,000 (Bushnell Park Foundation — park improvements)
Lebanon $250,000 (Land and/or water rights acquisition for Lake Williams)
Manchester $250,000 (Clean-up of Center Springs Pond)
Meriden $600,000 (Land acquisition for open space land)
Middletown $300,000 (Open space preservation and recreational improvements in Harbor Park area);$1,000,000 (Purchase of Cenade property for open space)
Naugatuck $750,000 (Repair and renovate indoor pool)
New Haven $2,000,000 (Construction of a transfer station); $1,500,000 (Landfill closure); $300,000 (Renovations to Lighthouse Point Park); $250,000 (Renovations to Bowen Field); $500,000 (Renovations and improvements to East Rock Park); $500,000 (Renovations to Edgewood Park); $300,000 (Renovations to West

Rock Nature Center); $75,000 (Development of harbor dredging and conservation plan); $3,000,000 (Installation of liners for landfill expansion); $450,000 (Study reuse of abandoned sewage treatment plant at Bayview Park as a marine recreation center and demolition tanks and settling basins); $350,000 (Athletic improvements); $3,600,000 (Primary and secondary clarifiers for East Shore sewage treatment plant)

North Branford $1,200,000 (Watershed preservation and protection of Farm River watershed area)

Oxford $50,000 (Land improvements and creation of park at Oxford Glenn)

Seymour $100,000 (Improvements to Sochrin Pond Recreation Complex)

Shelton $50,000 (Erosion control in Housatonic River area)

Waterbury $2,000,000 (Heritage Park program); $750,000 (Park infrastructure program); $500,000 (Improvements to Municipal Stadium)

West Haven $300,000 (Repairs and renovations to Quigley Stadium); $1,795,000 (Install new sewers and water service in Lake Phipps area); $200,000 (Planning and design of Front Avenue pump station); $200,000 (Planning and design of Dawson Avenue pump); $60,000 (Erosion control at Bayview Place)

Windham $150,000 (Heritage Park Program)

II. *WATER QUALITY*

1) PA 90-222 AAC Water Pollution Control

Setting Penalties. Under this act, judges will have to consider whether a violator is a "persistent violator" in determining the amount of civil penalties for violations of state water pollution control laws. This act defines "persistent violator" as a water discharge permit holder which exceeds the permit's restrictions for four of six consecutive reporting periods.

Courts may consider the nature and seriousness of the violation, any prior history of violations, and whether the violator gained any economic benefit.

Citizen Suits. This act authorizes courts to award legal costs to any private entity which successfully sues for declaratory relief or which intervenes as a party and obtains relief in a judicial review of an administrative agency's action.

Regulations. DEP must adopt regulations establishing categories of water discharges, including stormwater discharges, which cannot reasonably be expected to cause pollution. These discharges would be exempt from the requirement to obtain a water discharge permit. Instead, any person or municipality responsible for this type of discharge would be required to register the discharge with DEP.

Effective Date: October 1, 1990.

The European Mantis

(Mantis religiosa)

State Insect of Connecticut

2) PA 90-301 AAC Efficiency of Municipal Sewage Treatment Plants

Requirements for Operators. The act authorizes DEP to establish requirements for the presence of approved operators at pollution abatement facilities. Qualifications of operators will be subject to DEP approval.

Sewage Treatment Plant Grants. The act establishes a grant program for certain types of wastewater treatment plant improvements. Under this program, DEP may provide 100 percent grants from the Clean Water Fund for structural improvements to secondary clarifier operations. Up to $3 million may be used.

Annual Reports. Beginning March 15, 1991, each municipal water pollution control authority must prepare an annual report. This report must include the number of people with permits for discharges to the local sewage treatment system; the trade name of each person with such a permit; the location, volume, and frequency of these discharges; and the trade name of each person with a permit to discharge who was in significant noncompliance with any permit provision. The report must be available to the public.

Five-Year Assessments. Beginning September 30, 1991, each municipality must submit an assessment to DEP every five years regarding the adequacy of its sewage system's operation and maintenance programs.

Clean Water Fund Conditions. This act adds several conditions which a locality must meet before receiving Clean Water Fund grants or loans. A locality must demonstrate to DEP that it has adequate legal, institutional, managerial, and financial capability to construct and operate the pollution abatement system over the design life of the facility.

Fines. After June 30, 1990, any funds forfeited to the state for discharging waste to a local sewer system in violation of a permit shall be deposited into the Clean Water Fund.

Effective Date: July 1, 1990.

3) PA 90-69 AAC Delegation by DEP of Certain Authority to Municipal and Regional Sewer Authorities

Regulations. This act allows DEP to adopt regulations delegating the authority to review and approve plans and specifications for the design and construction of sanitary sewers to towns or regional sewer organizations.

Effective Date: October 1, 1990.

4) PA 90-275 AAC Revisions to the Aquifer Protection Act

Existing Regulations. This act extends the deadlines for several regulations required under last year's aquifer protection law (PA 89-305). Under this act, DEP now must publish a notice of intent to adopt the regulations for land use controls and farm resource management plans in aquifer protection areas by July 1, 1991. The act also sets a July 1, 1990 deadline for publishing the notice of intent to adopt regulations regarding detailed aquifer mapping.

The act makes several substantive changes in these regulations as well. The definition of "regulated activity" is expanded to cover conditions that DEP determines by regulation to involve material that may threaten groundwater. The regulation also shall address all aspects of underground and aboveground storage tanks.

New Regulations. The act authorizes DEP to adopt other regulations to implement the provisions of the aquifer protection acts. These areas include:

1) procedures for establishing and amending the boundaries of aquifer protection areas;

2) standards for submission and review of applications to begin regulated activities;

3) procedures for granting, limiting, revoking, suspending, modifying, and transferring permits for regulated activities;

4) controls on expansion of nonconforming regulated activities;

5) registration requirements for existing regulated activities and procedures for transferring registrations; and

6) procedures for landowners to notify localities or DEP of land use changes.

Level A Mapping. This act authorizes DEP to produce level A maps for small water companies, including the water contribution areas surrounding their wellfields. The act provides up to $300,000 to be allocated from the Emergency Spill Response Fund for DEP for this purpose.

Farm Resource Management Plans. The act raises the cut-off level for farmers required to submit farm resource management plans to farms with annual gross sales of $2,500. The act also clarifies the role of soil and water conservation districts when farms overlap two or more districts. Finally, the act provides up to $120,000 from the Emergency Spill Response Fund for the inventory and evaluation of farm resource management plans.

Local Maps. The act requires aquifer protection areas to be shown on any local maps required by state law.

Effective Date: July 1, 1990.

5) PA 90-341. AA Establishing Various River Commissions; Concerning Bantam Lake and the Shepaug River Protection Commission; Establishing a Task Force on Migratory Birds and Conservation Stamps; and Making an Appropriation to the Connecticut River Gateway Commission

The White Oak
(Quercus alba)

State Tree of Connecticut

Bi-State Pawcatuck River Commission. This act establishes a 10-member commission to make recommendations on the maintenance, protection, and restoration of marine resources in the Pawcatuck River.

Housatonic Estuary Commission. This act authorizes the towns of Shelton, Derby, Ansonia, Orange, Stratford, and Milford to establish a Housatonic Rivery Estuary Commission. The commission may make recommendations on maintaining, protecting, and restoring the estuary.

Bi-State Farmington River Commission. This act establishes an 18-member Farmington River Commission, nine members each from Connecticut and Massachusetts.

Shepaug Bantam River Protection Commission. This act requires the Commission to review and comment on all applications affecting the Shepaug River or the Bantam River which are received by local inland wetlands agencies.

Migratory Bird and Conservation Stamps. This act establishes a task force to study the feasibility of establishing a migratory bird and conservation stamp program.

Connecticut River Gateway Commission. This act appropriates $12,125 to the Commission for the fiscal year ending June 30, 1991.

Effective Date. This act takes effect on July 1, 1990, except the sections on the Shepaug Bantam River and the Housatonic River Commission take effect on October 1, 1990.

6) June Session, PA 90-1 AA Amending the Clean Water Program to Provide the State with Greater Flexibility in Issuing Revenue Bonds

Revenue Bonds. This act amends last year's legislation (PA 89-377) to increase the state's ability to issue revenue bonds under the Clean Water Fund. These changes will enable the state to leverage an additional $100 million in revenue bonds for sewer and wastewater treatment projects, using the $100 million in General Obligations bonds included in the bond package.

Long Island Sound Account. The act supports minimum levels of funding of $110 million for the Long Island Sound Account over the next seven years. The act recommends a bond authorization of at least $5 million in 1991, $16 million in 1992, $20 million in 1993, $16 million in 1994, $12 million in 1995, $34 million in 1996, and $7 million in 1997.

Nitrogen Removal. The act expands the activities eligible for funding from the Long Island Sound Account to include interim improvements to municipally-owned wastewater treatment facilities which discharge into coastal waters to remove nitrogen from these discharges. The act provides for grants of up to $100,000 to municipalities for this purpose.

Effective Date: July 1, 1990.

III. *COASTAL RESOURCES*

1) PA 90-297 – AA Increasing Certain Bond Authorizations for Capital Improvements

Bond Funds. This act provides an additional $125 million in General Obligation bonds for the Clean Water Fund, with $25 million set-aside for the Long Island Sound Account. The act also expands the activities eligible for funding from the Long Island Sound Account to include:

a) the restoration and rehabilitation of tidal coves and embayments, and

b) laboratory development to aid analysis of water quality samples collected as part of the Long Island Sound ambient monitoring program.

Of the new funds for the Long Island Sound Account, $20.5 million has been earmarked for combined sewer overflow projects; $3 million for restoration of coves and embayments; $1 million for research grants; and $500,000 for laboratory development.

Effective Date: July 1, 1990.

2) PA 90-173 – AA Regulating Discharge of Sewage from Vessels

No Discharge Zones. This act prohibits the discharge of sewage from vessels in certain designated areas, known as "no-discharge zones," to protect shellfish beds and bathing areas. These harbor areas are: Branford; New Haven; Bridgeport; Norwalk; Clinton; Stamford; Fairfield; Stratford; Greenwich; Westbrook; Groton; West Haven; Madison; Westport; and Milford.

The act also designates the Connecticut River between Windsor and Old Saybrook as a no-discharge zone.

Pump-Out Stations. DEP may require any docking facility with more than 150 slips to provide and operate pump-out facilities or to have a contract for use of a reasonably proximate facility. If a no-discharge zone does not contain a docking facility with over 150 slips, DEP may require the docking facility with the greatest number of slips to provide pumpout facilities.

Penalties. The act establishes a class A misdemeanor for discharges of untreated sewage into state waters from any boat equipped with a marine sanitation device (MSD) that has a bypass, pump, or other system that allows untreated sewage to be discharged. The penalty for a class A misdemeanor is up to $1,000, one year's imprisonment, or both.

Civil fines of up to $10,000 may be imposed. Criminal penalties may be imposed if a sewage discharge or a failure to provide pump-out facilities was wilful or criminally negligent. A first offense may be penalized up to $25,000 per day, one year imprisonment, or both. Subsequent offenses may be charged up $50,000 per day, two years imprisonment, or both.

Effective Date: October 1, 1990.

3) PA 90-111 – AAC Structures and Dredging

General Authority. The act reemphasizes DEP's authority to regulate the retention and maintenance of any structure, dredging, or fill in tidal or navigable waters.

Routine Maintenance. Under this act, routine maintenance of permitted structures, fill, obstructions, or encroachments is exempt from having to get DEP permit or certificate of permission.

Certificates of Permission. The act creates a new accelerated permit process, known as a "certificate of permission," to handle certain types of activities. The activities include substantial maintenance or repair of permitted structures, fill, obstructions, or encroachments, as well as those structures in place prior to 1939 which have been continuously maintained.

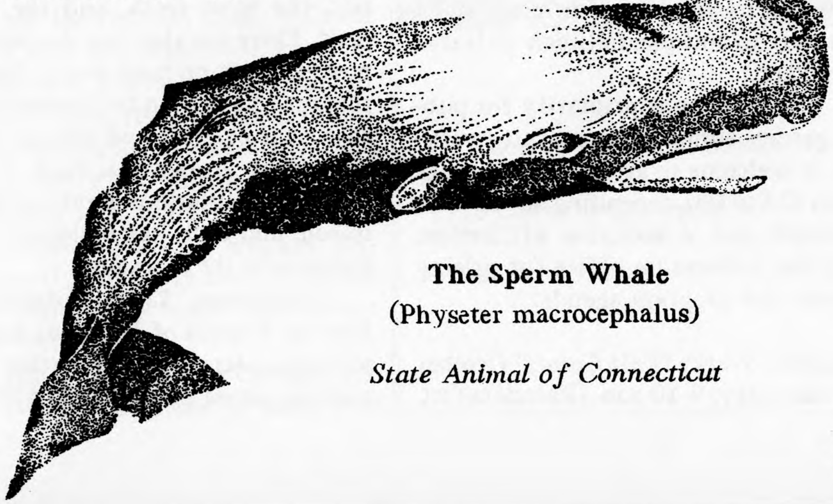
Automatic Approval. Under this act, DEP must act on request for a certificate of permission within 45 days of receipt. If DEP fails to respond within this time period, the application for a certificate of permission is automatically granted.

Emergency Authorizations. DEP may provide emergency authorizations in situations involving immediate, unforseen and unacceptable hazards to life, health or welfare or significant loss of property.

Removal of Hazardous Structures. Under this act, DEP may remove, abate or, alleviate any condition which constitutes, or is likely to cause, an imminent and substantial hazard to public safety or navigation.

Effective Date: October 1, 1990.

(*The legislative summary will be continued in the next issue of* Connecticut Environment.) ■



The Sperm Whale
(Physeter macrocephalus)

State Animal of Connecticut

Connecticut College Arboretum

A new addition has recently been made to the informative series of Connecticut College Arboretum bulletins. This is Bulletin No. 31, *Birds of the Connecticut College Arboretum.* This 50-page booklet is an annotated list with seasonal records, and an account of the bird research program. The cost is $5.50. The publication is available from the Connecticut College Arboretum, Box 5511, Conn. College, 270 Mohegan Ave, New London, CT 06320-4196. Include $1.00 postage and handling. Bulletins are also available in the college bookstore.

The American Association of Botanic Gardens and Arboreta will hold its Northeast regional meeting at the Connecticut College Arboretum on Saturday and Sunday, October 13 and 14. Registration is required. Saturday's events commence with a keynote speech on global warming followed by sessions on environmental education and computerized plant record databases. Tours of the Caroline Black Garden, Arboretum and Campus collections, a buffet lunch and dinner, social hour and lecture on the reconstruction of Harkness Park's garden round out the day's events.

Sunday's program includes the Association's business meeting, reports from several arboreta, botanical gardens and horticultural societies, and a bus tour to and picnic lunch at Harkness Park.

The meeting is primarily for public garden administrators, but everyone is welcome to attend. Prices range from $25 to $80, depending on the days attended and Association affiliation. Call the Arboretum office for pricing details and program agenda.

Monthly Walk: "Fall Color," October 20, Saturday, 9-10 a.m. (Raindate Oct. 21, same time)
Cost: Free.

See leaf death at its most spectacular during the Arboretum's annual autumn amble. Few places on earth can rival New England's spectacular fall colors, for the cold nights and clear days provide just the right conditions to produce a biochemical wonder in our deciduous trees.

Arboretum staff will lead the tour and discuss how and why New England's fall chorus of colors occurs.

Monthly walks are informal field trips encouraging firsthand observation and questions. Participants will meet at the Arboretum Main Entrance on Williams Street.

Please register with payment at least one week before program date. Make checks payable to the Connecticut College and mail to: The Connecticut College Arboretum, Box 5511, Conn. College, 270 Mohegan Ave., New London, CT 06320-4196. For further information, phone: (203) 439-2130. ■

Dinosaur S.P.

The following lecture will be given at Dinosaur State Park in Rocky Hill: "Dinosaur Champions." Date and time: October 16, 1990 7:30 p.m.

Lecturer: Dr. Walter Coombs, Associate Professor of Biology, Western New England College.

Description: Dinosaurs include the heaviest, tallest, and longest land animals that have ever lived. They also boast the largest herbivore, the largest carnivore, the longest neck, the longest tail, the most teeth, and the largest head. There are also tiny dinosaurs, dinosaurs with no teeth at all, dinosaurs that may have been the fastest runners that ever existed, and dinosaurs that lived near Antarctica. Each of these extreme adaptations developed for a reason, and each has biological consequences for the dinosaurs.

Admission: $2.50. Admission is free for Friends of Dinosaur Park Association Members. For futher information, please phone (203) 529-8423 ■

Osprey Update

Connecticut's osprey population -- once almost totally depleted -- increased again during the 1990 nesting season. State biologists observed 53 nests statewide, and report 92 young were fledged.

Statewide nest productivity decreased slightly, from 1.75 young fledged per active nest in 1989 to 1.73 in 1990. "This slight reduction in young fledged per nest is not significant," said Victoria. "Ospreys, like most natural populations, experience annual fluctuations in productivity, and with continued fish availability, the number of young fledged should remain high."

The DEP Wildlife Division plans to print a brief newsletter discussing the 1990 osprey nesting season results. Copies may be obtained by contacting the Nonharvested Wildlife Program, at Sessions Woods Wildlife Management Area, P.O. Box 1238, Burlington, CT 06103. (203) 584-9830. ■

Viewing Reminders

The video series *Environment*, hosted by Robert Paier and produced by Sandra Sprague, addresses a broad range of Connecticut's environmental issues. *Environment* may be seen on the following public access cable systems: United Artists/Hartford -- Mondays at 8:30 p.m.; United Artists/Plainville -- Mondays at 8:30 p.m.; Storer Cable of New Haven -- Tuesdays at 8:30 p.m.; Dimension Cable -- Tuesdays at 5:30 p.m. and Wednesdays at 7:30 p.m.; and Simsbury Community Television -- Wednesdays at 9:00 p.m.

On Thursday, November 1, at 8:30 p.m., a special report on Long island Sound will be broadcast on Connecticut Public Television. This program is part of the *Environment 2000* series and is sponsored jointly by CPTV and the DEP. The program will be followed by a call-in period. ■

Trailside Botanizer

American Beech

by
Gale W. Carter
Illustration by
Pamela Carter

AMERICAN BEECH (*Fagus grandifolia*) with its smooth, tight gray bark is an easy tree to recognize. It is a medium to large tree with a rounded crown and many spreading horizontal branches. The usual height is 60 to 80 feet, but it sometimes may be as tall as 120 feet. Some call it the "initial" tree because the bark retains carved initials and dates.

The alternate leaves are thin and crisp like a new dollar bill. Veins in each leaf are straight and terminate at each tooth of the sharply serrated margin. The bleached and withered leaves persist on the tree long into the winter. The twigs are somewhat zig-zagged and the winter buds are long and pointed and covered with shiny scales.

© copyright 1990, Gale W. Carter.

Male and female flowers are separate but on the same tree. They appear in late April or early May about the time the leaves are unfolding. The fruit is small and covered with prickly burs. Its outer husk splits into four parts to reveal two triangular seeds with sharp edges. September to November is the season for fruiting.

Beech can grow in a variety of sites both in upland and lowland, if the soil is moist and fertile.

The origin of the genus name is not clear but the species name "grandifolia" means big-leaved.

The uses of American beech are many and varied. It makes a handsome shade tree and the wood is useful for fuel, charcoal, and tool handles. The old-fashioned wooden clothes pins were made of beech because of the elastic quality of the wood.

A great many mammals and game birds eat the nuts and it is the preferred food of many song birds such as blue jays, woodpeckers, tufted titmice and common grackles. Historically, the nuts were also relished by the early settlers while the leaves were used to make a decoction for treating burns and frostbite. ■

The Night Sky

Time is Real

by
Francine Jackson

ONCE AGAIN, it's "fall back" time. We are finally able to recoup the hour we lost several months ago when daylight savings time took over most of the U.S. Many people, when talking about the gain or loss of that time, actually say they "feel" older or younger when the clocks change, or if they travel to different time zones. This is quite amazing, especially since the concept of time keeping is artificial.

Time, of course, is real. The passage of time, day to day, year to year, is a natural occurrence. But the measurement of time was brought on as a convenience to us humans, who felt the need to standardize our lives.

Oddly enough, standardized timekeeping in the United States was brought on, not by the government, but by the railroads. As late as the latter half of the 19th century, many religions based their time by the sun. When it was due south, it was noon. Because of this, one person's watch very often differed significantly from his neighbor's; if his lands were expansive enough, his hired hands quite possibly used their own time.

When the railroad came, it found itself in a unique position. Because of its motions in the east-west direction, it had to create its own timekeeping system; otherwise, at times it would actually arrive at a destination earlier than it had left. Unfortunately, this newly-created railroad system differed greatly from any local time, and people using their own time often missed their trains.

In 1884, the time zone concept radically changed the face of time. The earth in effect was divided into 24 slices of one hour increments. Although the system is not perfect, it allows enough of a convention for life on earth to function reasonably. And now that we have fallen back and retrieved our hour again, we can feel younger, and perhaps more willing to go out into the earlier darkness and look up at the beauty of the night sky. ■

Endnote

"I hereby leave and bequeath
In perpetuity
To this bird this fence."

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